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CHARLES ROBERT OSTEN SACKEN,
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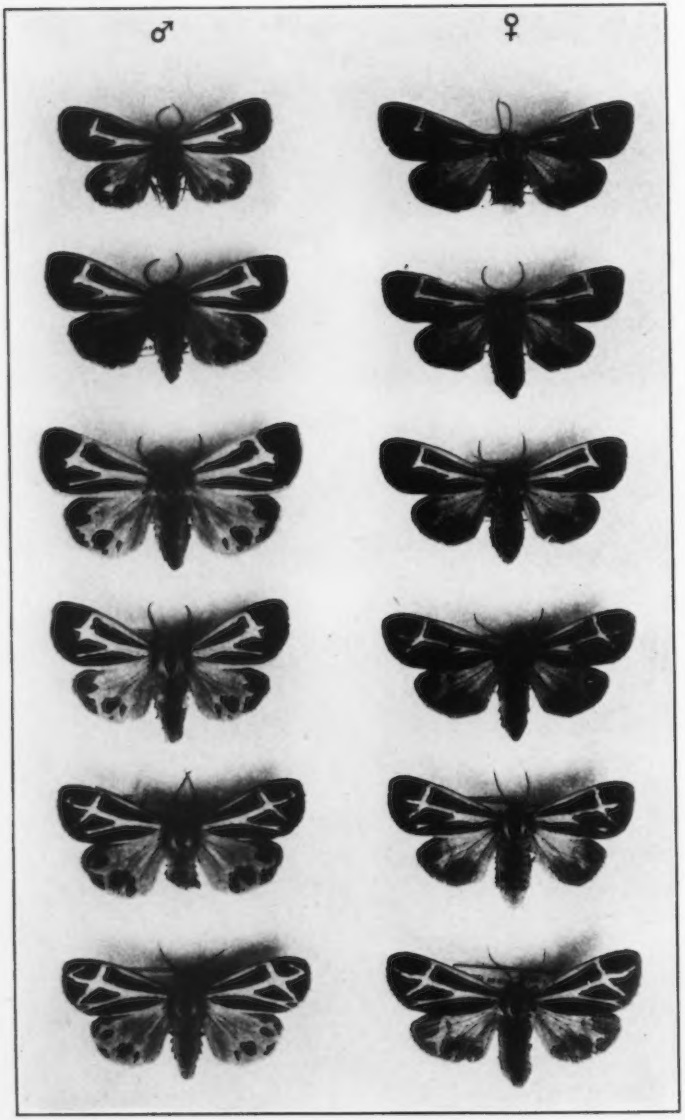

APANTESIS VITTATA.—LEARNED.

ENTOMOLOGICAL NEWS

VOL. XXXIX NOVEMBER, 1928 No. 9

The Early Stages of Apantesis vittata (Lep.: Arctiidae).

By ELMER T. LEARNED, Fall River, Massachusetts.

Plate XII.

This paper is offered as a contribution to the knowledge of *Apantesis vittata* (Fabr.) (=*decorata* Saunders) by describing the life history of the larva and recording certain variations in the imago.

There is little to be found in the literature on the larva of *A. vittata.* French published brief descriptions, but his determination of the species is doubtful. Hampson has regarded *phalerata* (Harris) as a synonym of *vittata,* and the references and notes on the larval stages found in his Catalog (Supplement, vol. II) under the name *vittata* actually refer not to this species, but to *phalerata* (save one reference to *radians*). *Phalerata* is very different from *vittata* structurally, and must be considered a distinct species. There remain the descriptions of the mature larva by Dyar and by Gibson as the only contributions on the preparatory stages to date.

The moth from which eggs were obtained was similar to the female figured at the top of the plate, but even more lightly marked, with faint costal fascia; the costal edge was black. This moth was taken in July at Hope, Arkansas, by Miss Louise Knobel. The eggs had just hatched when received.

In the description, Dyar's (1901) system is used for the setae or warts. The thoracic and abdominal segments are numbered separately, and designated by Roman and Arabic numerals respectively.

Stage I. Length 1.8 mm. Head 0.42 mm. wide. Head black with suture lines, front (frontal triangle) and mouth parts pale, except mandibles which are brownish. Body is grayish, tinged with yellow after eating. Warts brownish, shiny. Three setae from the cervical shield, those from ii and

iii on thorax, the seta from ii and one from iii on abdomen, are black, the rest white. All setae are finely spinulate. Legs and prolegs concolorous with body. The first molt took place July 30.

Stage II. Head 0.60-0.64 mm. wide. Head shiny black, the front dull white with a brownish spot in its center; there is a pale brown area on each side of the head at the posterior edge. Body brownish, with a white dorsal line, widening on each segment opposite wart ii, so that it appears like a series of diamond shaped spots. Warts black; wart ii conspicuously larger than the others. All setae from ii, some from iii, and one from iv and v are black, the rest white. Some setae from ii on III, and all from ii on 1 to 7, are smooth; all others are spinulate except some small ones on legs and ventral warts. In this stage a seta makes its appearance on segments II and III just posterior to wart v. Legs black, prolegs like body. The second molt occurred August 3.

Stage III. Larvae 6 mm. long, head 0.96 mm. wide. Head shiny black; front now almost entirely brown. There is a white dorsal line, ill-defined on segment I; it is obscure at the incisures so as to appear interrupted. Viewed laterally the larva appears ochreous due to the large amount of this color between warts ii and iii, and iii and iv, the area so colored being shiny and slightly raised like a broad, low ridge between these warts. The ochreous between iv and v is less extensive, paler, and permits the pale grayish body color to appear on either side of it. There is pale ochre also between v and vi. The area before and behind ii is brownish contrasting with and evenly defining the upper limit of the ochreous patch between ii and iii. A similar brownish area behind iii serves to define the lower border of the ochreous patch and thus gives the appearance of an ochreous sub-dorsal line. On the thoracic segments in the subspiracular area the ochreous is replaced by an inconspicuous dull brown. On the abdomen posterior to wart v is a diffuse, dull brown color like that on the thoracic segments. Warts are black. Setae from i are white, from ii black; from iii black, with one or two white ones; from iv and v one black, the rest white. Setae from cervical shield are mixed black and white. Legs black; prolegs with an outer dark area and pale plantae, else like the body. Spiracles inconspicuous. The third molt came on August 6.

Stage IV. Length 9.5 mm. Head 1.3 mm. wide, black, shiny; front is now black and the former white markings reduced to dull yellowish along the suture lines, often obsolete. The lighter area previously present on the side of the head is obsolete; clypeus and bases of antennae are white. Larvae essentially as before, but the markings intensified, the grayish body

color scarcely apparent between the markings of brown and ochreous. The white dorsal line is sometimes tinged with yellow near the edge of the segment. A white subdorsal line is more or less clearly indicated in different larvae. It is crossed by the ochreous color between ii and iii, which sometimes entirely obscures it and gives the effect of an ochreous subdorsal line. The ochreous at the bases of the warts is even more conspicuous than in the last stage, especially between iii and iv. Warts are black, and all, especially the base of ii, are polished. Setae from i, ii and iii on abdomen are all black; There are one or two black ones from iv, v and vi, the rest white. Spiracles are black, the first and last with orange center. The fourth molt occurred August 10.

Stage V. Length 1.5 cm. Head 2.3 mm. wide. Suture lines and base of front marked inconspicuously with dull brownish. Body black. The white dorsal line is variable and in some larvae obsolete. When well developed it begins faintly on segment II and extends through 9, beginning narrowly at the anterior edge of each segment, widening to just behind wart ii, then narrowing abruptly to the posterior edge where it may be tinged with yellow. Subdorsal line if present is even less clearly defined than before. There are no markings on segment I, few or none on II and III; none except the faint dorsal line on 9. Setae from i, ii and iii are black; the rest mostly pale or with a rusty tinge. Spiracles orange. The intensity and extent of the markings vary greatly in this stage, from larvae with sharp, white dorsal line and bright ochreous markings, to larvae which are almost entirely black. The fifth molt came on August 14.

Stage VI. Head 3.0 mm. wide (average specimen); suture lines not marked. There was considerable variation in the size of the head in this stage, though all larvae were known to have molted an equal number of times. Body black, dorsum darker than the lateral area. There is the same variation in coloration as in the preceding stage. In general those larvae with the best developed dorsal line also have the most conspicuous ochreous markings, and vice versa. In many, all markings are obsolete. The base of wart ii on abdominal segments is moderately polished anteriorly and laterally. Setae from i, ii and iii are black; those from iv mostly black, with a few like those of v and vi, which are straw colored or pale rusty; v with an occasional black one. Setae from cervical shield mixed black and rusty. In this stage, most of the setae from ii and iii on segments II and III, all setae from the three upper warts on all abdominal segments except the last, and a few setae from the lower warts, are smooth and needle-like; the rest are spinulate. The change from spinulate to smooth setae takes place

progressively through the preceding stages, beginning in stage II.

Larvae began to spin cocoons on August 23 and the first ones pupated on the 25th. Most of the larvae chose the upper angles of the cage to spin their loose, thin cocoons; a few crawled under paper on the bottom. The larvae were fed on plantain and dandelion in the early stages, later on lettuce.

An average size pupa is 2.0 cm. long by 6.5 mm. at greatest width, clothed sparsely with very minute, short hairs. Color is black, without bloom. In some pupae the intersegmental membrane is dark chestnut, in others concolorous with body. Spiracles are concolorous. On each side of the vertex is a bunch of stiff bristles of two kinds: short, stout, sharp bristles, and others with the end rough and flattened similar to those of the cremaster. One or two minute spines at base of antenna. Cremaster with a longitudinal groove at base, and armed with about twenty stout spines of varying length, the two apical ones the longest, all with the ends slightly enlarged, somewhat cone shaped, and much roughened. The larval skin clings closely to the end of the pupa.

The brood of about fifty larvae seemed healthy, only two or three being lost, but there was a high mortality in the pupal stage. Twenty-eight moths emerged, however, between September 7 and 22.

All the moths varied from normal *vittata* in having the costal edge of primaries black instead of yellow, and also in peculiarities of the male genitalia which have been described and figured elsewhere[1]. The hind wings were red in all specimens, the abdomen ochre; the black dorsal stripe always even, never widening on the anal segments.

Eggs were obtained from these moths, laid in mats attached to the sides of the cage. Color pale yellow, surface finely shagreened. Diameter .76 mm. height .66 mm. The pale yellow changed gradually to pale, lustrous amber, and the shell became transparent.

The larvae of the second generation in the earlier stages were like those described, but with an increasing tendency as they grew older toward obsolescence of the maculation. In the last stage all larvae were entirely velvety black except for the

[1] Psyche 1927, xxxiv, 141, Pl. IV.

orange spiracles. There was no dorsal line or ochreous marking. The setae of the two lower rows of warts, and some on the thorax, were rusty reddish. In a few larvae a faint whitish dash on the 5th or 6th segment represented the remnant of a dorsal line. The loss of color in the second generation larvae may have been due to temperature differences, as they were reared during October and November, and matured slowly. The moths emerged in December and January.

In this second generation four males and five females out of about thirty moths had the yellow costa normal to *vittata* (Plate: third male, second female). Otherwise they were all like those of the first brood. The same variations in the male genitalia were found in both generations.

The occurrence of the black costa is probably a mutation; its reappearance in the second generation suggests a Mendelian character. There is a possibility it may indicate hybridism, but as I have stated elsewhere[2], cross-breeding seems improbable.

Though the moths vary from the usual form, the pattern and color is in general that of *vittata* in the majority of specimens, and the genitalia, though aberrant, confirm the determination.

The plate shows the range of variation which may occur in these moths in one brood. The commonest variety was that most typical of the species, without any indication of the terminal band. At one extreme the species resembles *radians* as in the lightly marked female at the top of the plate, while the specimen at the bottom with more complete pattern and tendency to breaking up of the black border of secondaries, could easily be mistaken for *phalerata*.

It is interesting to compare the plate with Seifert's[3] illustrations of *nais* and *radians* to observe the similar range of variation in all these species; an equal range is found in *phalerata*. As Seifert says: "Each species is nevertheless bound to certain limits; and while the characters inclined to variation are the same in all, each species aims at a different ideal toward which the majority of its individuals develop."

[2] Psyche, 1927, XXXIV, 138.
[3] Jour. N. Y. Ent. Soc. 1902, x, 4, Pl. II; 82, Pl. XI.

Mark Catesby.

By HARRY B. WEISS, New Brunswick, New Jersey.

"The Planters by the richness of the Soil, live after the most easie and pleasant Manner of any People I have ever met with; for you shall seldom hear them Repine at any Misfortunes in life, except the loss of Friends, there being plenty of all Necessaries here, and the Planters are the most hospitable People that are to be met with. . . ."

"The Country in general is adorned with large and Beautiful Rivers and Creeks, and the Woods with lofty Timber, which afford most delightful and pleasant Seats to the Planters, and the Lands very convenient and easie to be fenced in, to secure their Stocks of Cattle to more strict Boundaries, whereby with small trouble of fencing, almost every Man may enjoy to himself an intire Plantation."

"The Girls are most commonly handsome and well Featur'd, but have pale or swarthy Complexions, and are generally more forward than the Boys, notwithstanding the Women are very Shy, in their Discourses, till they are acquainted. The girls are not only bred to the Needle and Spinning, but to the Dairy and domestick Affairs, which many of them manage with a great deal of prudence and conduct, though they are very young."

"The Men are very ingenious in several Handycraft Businesses, and in building their Canoes and Houses; though by the richness of the Soil, they live for the most part after an indolent and luxurious Manner; yet some are laborious and equalize with the Negros in hard Labour, and others quite the Reverse; for I have frequently seen them come to the Towns, and there remain Drinking Rum, Punch and other Liquors for Eight or Ten Days successively. . . .

"This Colony boasts more Advantages than several others on this Continent, both for Pleasure, Ease and Profit: Were the Inhabitants as industrious as the Soil is bountiful they might supply themselves with all the Necessaries of Life. With little Industry they may have Wines, Oil, Silk, Fruits, and many sorts of Drugs, Dyes, &c. Here the Curious may have a large Field to satisfie and divert their Curiosity; here they may collect strange Beasts, Birds, Fishes, Insects, Reptiles, Shells, Mines, Herbs, Flowers, Plants, Shrubs, Trees, Gums, Tears, Rosin, Stones, and several other things that yield both Profit and Satisfaction." *

Such was the Carolina, where Catesby, who was probably the first illustrator of North American insects, lived for some

*The Natural History of North Carolina by John Brickell, M. D. (Dublin, 1737).

years, hunted with the Indians, and where he collected and painted specimens of natural history.

Born in England, probably in London, about 1679 or 1680, he came to America in 1712, landing in Virginia April 23 of that year. Catesby had relatives in Virginia, but in addition he wanted to explore the natural history of countries other than his own. He stayed seven years or until 1719, and according to his own statement, did little but observe and admire the fauna and flora. However, he took back to England with him, a collection of plants and specimens which excited the interest of Sir Hans Sloane and Doctor Sherard.

During the next several years he arranged and named his specimens, a number of which found their way into Sloane's museum. Dr. William Sherard, with whom Catesby became friendly through their mutual botanical interests, advised him to undertake a more serious study of the fauna and flora of Carolina and the neighboring areas with the idea of publishing his findings. And so after getting financial help from twelve "noble Persons and Gentlemen," including Sir Hans Sloane, Richard Mead, M. D., His Grace the Duke of Chandois, and the Honorable Colonel Francis Nicholson, Catesby, with this idea, left England in 1722 and landed in Carolina May 23 of the same year. Upon his arrival at Charles Town he immediately called upon General Nicholson, who was then governor of South Carolina. From then on until 1726 he was busy with his observations and explorations.

Upon his return to England in 1726, he found his work so favorably received that he was advised to publish it, but on account of the expense of engravings, this did not seem possible. However, Mr. Joseph Goupy advised Catesby to study etching and do the work himself. This he did and as a result there finally appeared, The / Natural History / of / Carolina, Florida and the Bahama Islands: / Containing the Figures of Birds, Beasts, Fishes, Serpents, Insects and Plants: / Particularly, the Forest-Trees, Shrubs, and other Plants, not hitherto described, / or very incorrectly figured by Authors. / Together with their Descriptions in English and French. / To which, are added / Observations on the Air, Soil and Waters: / With Remarks upon / Agriculture, Grain, Pulse, Roots, &c. /

To the whole, / Is Prefixed a new and correct Map of the Countries Treated of. / By / Mark Catesby, F. R. S. / Vol. I / London / Printed at the Expence of the Author, and sold by W. Innys and R. Manby, at the West End of / St. Paul's, by Mr. Hauksbee, at the Royal Society House, and by the Author, at Mr. Bacon's / in Haxton: / MDCCXXXI.

This is an imperial folio occupied almost entirely by plates of birds resting on trees and shrubs, with brief descriptive text, in English and French. Catesby gave the plants English and Indian names, and Doctor Sherard supplied the Latin ones. As for the birds he called most of them "after European Birds of the same Genus, with an additional Epithet to distinguish them."

Volume II, which appeared in 1743, covers fishes, crabs, turtles, snakes, plants, lizards, frogs, squirrels, rabbits, trees, etc., and the last part is devoted to the soil, weather, agriculture, the Indians and their manufactures and arts. Catesby was too busy with plants and birds to pay much attention to insects, concerning which he says. "As for Insects these Countries abound in numerous kinds, but I was not able to delineate a great Number of them." However, he did manage to figure twenty-six, all but three appearing in the last volume and almost half of them being lepidopterous. The insects appear only incidentally on the plates sometimes associated with the plants, and the entomological text is quite brief, dealing with colors and markings and sometimes the caterpillars and cocoons.

Allibone refers to Catesby's work as having been published in numbers from 1731 to 1748 and in Pulteney's "Sketches of Botany" it is noticed as follows: "In this splendid performance the curious are gratified with the figures of many of the most beautiful trees, shrubs, and herbaceous plants that adorn the gardens of the present time." According to Hagen,* a second edition revised by Edwards appeared in London in 1754, and a third edition with a Linnaean index in 1771. A German translation was published at Nüremberg in 1756. There also appeared at Nüremburg in 1750 and in 1777 his "Piscium Serpentum, Insectorum aliorumque nonnullorum Animalium nec non Plantarum quarundam Imagines."

*Bibliotheca Entomologica.

Of Catesby's insect illustrations, Walton states that his work is "rather crude as compared with that of contemporaneous illustrators of the better class, and does not approach the excellence of the artists of a slightly later period, such as that of Abbot, William Wood, Jr., or Peale." Of his own work Catesby says, "As I was not bred a Painter I hope some faults in Perspective, and other Niceties, may be more readily excused, for I humbly conceive Plants, and other Things done in a Flat tho' exact manner, may serve the Purpose of Natural History, better in some Measure than in a more bold and Painter like Way."

Catesby in 1747 read a paper "On the Migration of Birds," before the Royal Society, which was supposed to contain new facts on the subject, and under his authorship there was produced in London in 1737 (?) or 1767 (posth.), "Hortus Britanno-Americanus, or a Collection of 85 curious Trees and Shrubs, the production of North America, adapted to the Climate and Soil of Great Britain," with seventeen colored plates. He died at the age of seventy in his home on Old Street, London, December 23, 1749.

In volume II of his "Natural History of Carolina," Catesby printed a "List of the Encouragers" of his work, numbering about 158 subscribers, some of whom took two and three books. This list embodies "Her late Majesty Queen Carolina, Her Majesty the Queen of Sweden, Sir Hans Sloane, Henry Trelawney Esq., The Right Hon. the Lord Carteret, Richard Mead" and many others including the following who were identified with the colonial life of this country: "Mr. John Bertram of Pennsilvania, Alexander Hume, Esq., of Carolina, The Hon. Rob. Johnson, Gov. of S. Carolina, Hon. Lieut. Gen. F. Nicholson, Gov. of S. Carolina, Thomas Pen, Esq., Proprietor of Pennsilvania, Sir John Randolph of Virginia, Benj. Whitaker, Esq., of Virginia, and The Hon. Alex. Skene of S. Carolina."

"John Bertram of Pensilvania" is of course the Pennsylvania Quaker, John Bartram, first to describe the plants of the New World. Robert Johnson was governor of South Carolina under the Proprietors and again in 1730 under the first regular Royal administration. In 1718 he had been active in putting down piracy. He died in 1735 and never saw the second volume of

Catesby's work. General Sir Francis Nicholson was industrious and experienced in colonial affairs. In 1689 he was Lieutenant Governor of the Dominion of New York; in 1690, Lieutenant Governor of Virginia; in 1694 Governor of Maryland; then again to Virginia where he succeeded Andris; then Governor of Nova Scotia, ending as Governor of South Carolina in 1720. Nicholson was a strong friend and patron of the Church and education. He was instrumental in starting churches from Rhode Island to Virginia, in the foundation of William and Mary College, and had a reputation for quarreling and mixing his love affairs with business. Thomas Penn, one of the sons of William Penn, founder of Pennsylvania, succeeded to the share in the proprietary formerly held by his brother John, who died in 1746. He was interested in the college at Philadelphia, the hospital, library and various literary, charitable and religious societies. Benjamin Whitaker was a lawyer and one time Attorney General and Chief Justice of South Carolina, and Alextnder Skene was a member of the Council about 1731, and interested in political affairs.

With the exception of John Bartram it is doubtful if the other colonial subscribers took more than a passing interest in natural history, or more than a gentleman was supposed to take at that time. Nevertheless, credit should be given them for their support, when the settlers were busy subduing the land and the Indians.

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An Additional Annotated List of the Ants of Mississippi.

With a Description of a New Species of Aphaenogaster (Hym.: Formicidae).*

By M. R. SMITH, A. and M. College, Mississippi.

(Continued from page 246.)

96.—APHAENOGASTER FULVA AQUIA var. PICEA Emery.

Boyle. Several colonies of this ant were found in the soil beneath logs at Boyle. The variety is characterized by being darker than the subspecies, the specimens being usually pitch-blacp; in other respects this and *aquia* are very similar.

97.—APHAENOGASTER TEXANA var. FURVESCENS Wheeler.

A. and M. College. A worker of what I believe to be this species was taken from the soil around the base of a stump. At a superficial glance one might confuse the workers of *texana* and its various forms with that of *fulva* and its forms. The heads of the workers of the former species are rounder posteriorly than the heads of the workers of *fulva* and its forms. The scapes of the former are longer and more slender and there are other important differences. This variety is a very dark form of *texana*.

98.—**Aphaenogaster texana flemingi** subsp. nov.

☿. Length: 4.3-4.6 mm. Head, excluding the mandibles, much longer than broad, slender, and very strikingly constricted in the region posterior to the eyes, but especially so at the junction of the head and thorax. Eyes rather large and prominent, convex, placed at a distance from the mandibles equivalent to one and one-half times their greatest diameter. Antennae long and slender, scapes surpassing the posterior angles of the head by at least one-third their length, segments 3-8 of the funiculus subequal, segments 9-12 slightly enlarged and forming a rather indefinite, distal club.

Viewed laterally, the segments of the thorax appear as follows: the prothorax is rather gently and evenly convex dorsally; the mesothorax bears a noticeable transverse depression midway of its length, and there is a prominent constriction between the mesothorax and the epinotum; the base of the epinotum is hori-

*A contribution from the Mississippi Agricultural Experiment Station.

zontal, longer than the declivity, and bears a pair of prominent, acute spines, which are longer than broad at their bases. Postpetiole rather voluminous, approximately twice the width of the petiole.

Head, thorax, petiole and postpetiole punctate; frontal area, legs, and gaster smooth. Mandibles, clypeus, frontal area, posterior region of the head, prothorax, legs, petiole, postpetiole and gaster shining, remainder of body subopaque.

Hairs yellowish, erect, sparsely scattered over the body. Pubescence also yellowish, most easily discernible on the antennae and legs, on which it is abundant and appressed.

Color ferruginous brown.

Type locality: A. and M. College, Mississippi. Descriptions based on many cotype specimens which are in the collection of Dr. W. M. Wheeler, the author, and the Department of Entomology, of the Mississippi A. and M. College.

A colony consisting of 90 workers and many larvae were collected from the base of a rotten pine stump during mid-January, 1928. In this stump were numerous termites, none of which seemed to have been disturbed by the ants.

This new subspecies is named in memory of the late Mr. Andrew Fleming of Sibley, Mississippi, a man who made many important contributions to the knowledge of the ants of Mississippi.

The worker of this new subspecies, although allied to the worker of *Aphaenogaster texana* Emery and its varieties *furvescens* and *carolinensis* Wheeler, differs in an important number of respects, namely: that its head is more strongly constricted behind the eyes, its epinotal spines are larger and longer, and its sculpturing more feeble. The posterior region of the head, and the dorsum of the prothorax are so faintly sculptured that they appear glabrous. Future studies of this species may necessitate raising *flemingi* to specific rank; for the present, however, this subspecies has been referred to *texana* because the worker resembles that of *texana* in having a head with very much rounded posterior angles, long, slender antennae, a similar petiole and postpetiole and other such characters.

99.—CREMATOGASTER MINUTISSIMA Mayr.

A. and M. College, Sibley. On January 27, 1928, a colony of this exceedingly small, yellow ant was dug from the soil at the base of a stump in a wooded area here, near the college. The colony was composed of at least 6 deälated females, several hundred workers, and numerous larvae. Another colony from the same type of habitat was found in the earth about six inches from the surface. This colony contained at least 8 or more deälated females, about 150 workers, but apparently no larvae.

In this locality *minutissima* does not appear to be as common a species as *victima* subsp. *missouriensis* Pergande. It ressembles this ant in many respects but is noticeably smaller. This species may prove to be a subspecies or variety of *victima*, as is *missouriensis*.

100.—STRUMIGENYS PULCHELLA Emery.

Columbus. Three workers and a deälated female were collected from beneath the bark of a pine log and a pine stump. The frass beneath the bark of both the log and stump was slightly moist. The deälated female which came from the stump was found there along with the following other species of ants: *Solenopsis molesta* Say, *Proceratium croceum* Roger, *Proceratium crassicorne* Emery and *Pheidole dentata* Mayr.

The worker of this species resembles the worker of *Strumigenys pergandei* Emery. It can be distinguished from the worker of that species however by its smaller size (1.5-1.66 mm.), by the presence of a prominent tooth near the base of each mandible, which is hidden by the edge of the clypeus, and also by the fact that the anterior edge of the clypeus only bears ten or twelve club-like or scale-like hairs.

Subfamily FORMICINAE.

101.—LASIUS UMBRATUS MIXTUS var. APHIDICOLA Walsh.

Boyle, A. and M. College. In a wooded area at Boyle, a large colony of this ant was found beneath a log. Among the ants were many pinkish mealy bugs, which Miss Gladys Hoke determined as *Pseudococcus morrisoni* Hollinger. Wingless aphids in the same nest were tentatively determined by Mr. A.

L. Hamner as *Pemphigus lactucae* (Fitch). The workers from this colony were much lighter in color and more glabrous than the typical form which was collected at A. and M. College in a rotten stump along the bank of a stream. A species of mealy bug near *morrisoni* was also found with this colony.

102.—PRENOLEPIS ARENIVAGA Wheeler.

Columbus. Many nests of this ant were found in the pure white sand in a locality near Columbus. The nests were small craters, each with a central entrance.

The workers of *arenivaga* are characterized by their pale yellow color, their glabrous bodies and by the fact that the hairs covering the body are dark at the base and light at the apex. The antennal scapes bear erect hairs.

103.—PRENOLEPIS IMPARIS var. TESTACEA Emery.

A. and M. College. This pale yellowish variety of *imparis* can be found nesting in the woods here. The ants seem to like moist spots for their nests. Their habits are similar to those of the species.

104.—FORMICA PALLIDE FULVA var. SUCCINEA Wheeler.

A. and M. College. A nest of this species was found on the side of a hill very near the edge of some woods. The nest of the ants extended for a foot and one-half in the clay loam. From this nest were taken many workers, pupae, larvae and eggs. The workers were very timid and tried to hide beneath particles of soil. I noted that some of them had been bringing in for food, the bodies of a soldier beetle, *Chauliognathus pennsylvanicus* DeGeer, an undetermined species of membracid, and some flesh flies.

This variety is distinguished from the species in that the ants are of a deeper reddish tinge and a more glabrous appearance than those of *Formica pallide fulva* Latr. The workers bear a very striking resemblance to the lighter forms of *Formica pallide fulva* subsp. *nitidiventris* Emery.

105.—FORMICA PALLIDE FULVA subsp. NITIDIVENTRIS Emery.

Boyle. A colony of this ant was found in the soil beneath a log in a dense woodland patch at Boyle. Beneath the same

log were three other species of ants, but none of these was nesting in contact with *nitidiventris*. The ants which were found here were: *Camponotus castaneus* Latr., *Lasius umbratus mixtus* var. *aphidicola* Walsh, and *Aphaenogaster lamellidens* var. *nigripes* M. R. Smith.

106.—FORMICA RUFA OBSCURIPES var. MELANOTICA Emery.

A. and M. College. Last spring (1927) one of the students brought to the laboratory a small worker of what I believe to be this species. When questioned as to where he had collected it, the student stated that he took the specimen in the edge of a patch of woods near the college. At my request he later went back to hunt for more specimens but was unable to find any.

New Bees From the Miami Region of Florida (Hymen.: Andrenidae, Megachilidae).

By S. GRAENICHER, South Miami, Florida.

Triepeolus rufithorax n. sp.

♀ Length about 10.5 mm. Head and abdomen black, thorax dark red with the exception of a greater portion of the metathorax, which is mostly black.

Punctures on lower sides of face very delicate and close, coarser above the antennae. Vertex shining, coarsely punctured. Mandibles red with dark tips. Labrum, clypeus, supraclypeal area and first three joints of antennae red. Clypeus minutely sculptured with scattered punctures, and a median low smooth and shining ridge above. Supraclypeal area distinctly punctured, produced into a narrow black-tipped ridge between the antennae. Sericeous pubescence on middle portion of face.

Golden ornaments distributed as follows: band on pronotum, attenuated towards the middle and slightly interrupted; a semicircular patch back of tubercle; a small patch behind the tegula; two parallel narrow bands below the scutellum, running into a tuft of long hairs on each side; a comma-shaped, oblique band on each side of posterior face of the propodeum; two indistinct short longitudinal lines on the mesonotum in front; a short, hardly visible line on the mesopleura. Mesonotum finely roughened, the same as the sulcate scutellum with its conical blunt tooth on each side. Mesopleurae more coarsely sculptured than mesonotum. Tegulae reddish testaceous, smooth and shin-

ing. Wings dark, especially their outer margins. Nervures and stigma black. Legs entirely red, including the tibial spurs. Claws dark.

Bands on abdominal segments 1 to 3 golden yellow. Apical band on first segment narrow and interrupted, widened considerably along the sides. Bands on second and third segments slightly interrupted, widened toward the margins, that on fourth entire and more cinereous. Fifth with a triangular cinereous patch on each side, its middle portion striato-punctate, slightly shining, and its apex truncate. The first ventral segment reddish on its posterior half, with a distinct median triangular pit near the apical margin. Ventral segments 2 to 4 finely punctured, shining, with a reddish tinge near their apices. Segment 5 rounded and its apex turned downward to a slight extent.

♂. Agrees very closely with the female. More pubescence on the face below and around the antennae. Ornaments lighter, more cinereous. Bands on the third to sixth abdominal segments distinctly cinereous. Apical plate narrowed considerably towards the rounded tip, and surrounded by a black ridge. A cinereous band on apex of ventral segment 2, ventral segment 3 entirely covered with cinereous hairs.

Type: ♀, Miami, July 16, 1927. Allotype: ♂, South Miami, July 22, 1924. Of the 24 paratypes, 18 were collected by the author at Miami and South Miami, and the following 6 are in the collection of the American Museum of Natural History of New York. The labels on these give the following information: 1 ♀, F. 4666 B, Miami, Fla., April 11-21, 1923; 1 ♀ F. 4667, Royal Palm State Park, Fla., April 12-18, 1923; 2 ♀ ♀, F. 4671S, Royal Palm State Park, Fla., April 12-18, 1923; 2 ♀ ♀, F. 4675A, Miami, Fla., April 11-21, 1923.

Three of these were captured at Royal Palm State Park, about 44 miles southwest of Miami, and these records establish a more southern range than my specimens indicate. For the loan of this material for study, I am greatly indebted to the Entomological Department of the American Museum of Natural History of New York, and in addition I wish to thank Mr. Herbert F. Schwartz, a member of that Department, through whose kind efforts I obtained the loan.

This species varies in length from about 9 mm. to 10.5 mm. There is also some variation in color; the red extends in some individuals to the first abdominal segment, and in two (♂ and ♀) even to the second.

The most conspicuous character of this species is the predominant red color of the thorax. The following parts are also red: mandibles, labrum, antennae at base, large portion of face, and legs except the claws. The yellow hairy ornaments of the thorax and abdomen show in fresh specimens a golden tinge. This combination of characters separates the species from any species of our fauna described so far.

Males have been collected from March 31 to June 22. The females are on the wing throughout the warmer season, from about March 28 to October 26. They were visiting the flowers of the following species: *Vernonia Blodgettii, Bidens leucantha; Melanthera radiata, M. parviflora, Flaveria linearis, Borrichia frutescens, Sida carpinifolia, Poinsetta cyathophora* and *Sabal palmetto* *. The first six mentioned belong to the Compositae.

Heriades crawfordi n. sp.

♀ Length about 7.5 mm. Face distinctly longer than broad, clothed with sparse white pubescence, which is short in the middle, longer on the sides next to the antennae. Punctures small and very close on the clypeus, coarser on vertex and occiput. A very narrow, low, shining ridge on upper middle of clypeus. Lower margin of clypeus straight. Mandibles broad, ending in a strong, pointed tooth. Antennae black.

Mesonotum closely punctured in front, more coarsely and sparsely towards the scutellum. Scutellum flat and shining, with few strong punctures. Pleurae more coarsely sculptured than mesonotum. Disk of propodeum with a transverse row of deep pits, bounded by a posterior high ridge. Posterior face with moderately deep punctures laterally, and a median smooth and shining sulcus, which broadens out above. Wings dusky on outer half. Tegulae, nervures and stigma black. Legs black, with testaceous claws, and long whitish hairs on posterior basitarsi.

Abdomen with clean-cut white apical hairbands on segments 1 to 5. Punctures small and close on segments 1 and 2, stronger and more separated on segment 3, and gradually becoming finer on remaining segments. Concavity on base of first segment shallow, bounded by a distinct narrow rim. Surface of concavity shining, with punctures in upper half, and a short sulcus below. Ventral scopa white.

♂ Length about 6.5 mm. Face narrower, body, and especially face, more hairy, and punctures in general finer and closer than in opposite sex. Second antennal joint about as long as broad, third shorter.

* Nomenclature according to Small's "Flora of Miami" or the same author's "Flora of the Southeastern United States."

Apical portion of abdomen bent downward and forward from third or fourth segment on. Sixth segment with a truncate apical margin, and a preapical depression on each side. First ventral segment produced considerably towards the middle of its apex. It forms a blunt projection covering the base of the second segment. The apical margin of the latter is slightly membranous in the middle. Segments 3 and 4 are thin and membranous to a greater extent. Segment 5 is split, forming 2 rounded membranous lobes. Membranous parts testaceous.

Described from 3 males and 12 females taken at South Miami, Miami and Hollywood, on the flowers of *Croton linearis, Pterocaulon undatum* and *Chrysopis Tracyi.* According to the records on hand, this bee flies during the cooler months, from about the end of October to the middle of April.

Type: ♀, South Miami, November 12, 1924. Allotype: ♂, Miami, December 4, 1924.

Large for a *Heriades.* The structures of the ventral segments in the male are very characteristic of the species. The ♂ of this species has the first ventral abdominal segment elongate medially, and agrees in this respect with *H. leavitti* Crawford, Can. Ent. 45, 270 (1913). In *H. leavitti* this elongation is pointed at the apex, according to the description, in *H. crawfordi* it is rounded. There is a distinct difference between the two in the puncturation of the dorsum of the abdomen. On the first 3 segments of *H. leavitti* the punctures are fine and close, "hardly half a puncture width apart". In *H. crawfordi* segment 2 has very close and fine punctures, on segment 1 the punctures are close but distinctly coarser, and on segment 3 coarse and mostly the entire width of a puncture apart.

H. leavitti is a smaller insect than *H. crawfordi.* The ♀ of the former has not been described.

The ♂ of *H. carinatus* Cresson, Proc. Ent. Soc. Phil. 2, 383, (1864) has the apex of the first ventral abdominal segment truncate, not elongate and a blunt tubercle on its disk. This separates it from either *H. crawfordi* or *H. leavitti.*

Stelis floridana n. sp.

♀ Length about 10 mm. Ground color black. Ornaments partly yellow, mostly red. Legs red. Head covered with short white hairs, especially around the antennae. Clypeus dull, closely and finely punctured. Rest of head shining with coarse

punctures. A broad band on side of face yellowish on lower half, reddish above. A transverse red band behind the eyes. Antennae black, lighter on flagellum beneath.

Punctures on mesonotum distinct and crowded, coarser and more separated on scutellum and sides of thorax. Tufts of white hair beneath tegulae and wings. A red band on each side of mesonotum, curving forward, and becoming yellowish, broadly interrupted on the front margin. Scutellum red, broadly rounded on sides, and slightly truncate at apex. Axillae red with punctures smaller than on scutellum. Tubercles red, shining, finely punctured. Tegulae red and shining, with fine punctures, and a faint dark annulus on top. Upper anterior corner of mesopleura red as far as middle of tegula and half way down. Spot under hind wing and a smaller one in lower hind corner of mesopleura red. Wings sooty, darker along the outer two-thirds of the front margin. Stigma brown, veins black. Middle femora broader than the other ones. Legs red, including tibial spurs and claws. Hind coxa large and flat, blackish on the outer surface.

Abdomen shining, coarsely puntured on second segment, finer on basal and third segments, and gradually becoming finer and closer towards the sixth. A narrow, smooth apical space on segments 1 to 5. First segment red, black at base; second with a red scarcely interrupted band, narrowed medially. Third with a subapical yellow band, narrow and emarginate in the middle. Subapical yellow band on the fourth, with lateral indentations and a median emargination. Fifth with a short emarginate yellow band, about one-third as broad as the segment. Sixth entirely black. Much red on the first ventral segment, and a faint indication of the same color along the apices of ventral segments 2 to 5. Sixth black, flat and rounded at tip.

♂ Length about 9 mm. Very much like the female, but ornaments differing as follows: red triangular mark on basal two-thirds of clypeus. Band on second abdominal segment more narrowed medially, that on third reddish, broadened on sides. Fourth with reddish ornaments, consisting of a short narrow median band, widely separated from a triangular spot on each extreme side. Remaining segments black. Apex of sixth segment truncate with a semicircular emargination. Seventh with an apical tooth. The first five dorsal segments are turned inward on the sides, thereby overlapping the ventral segments. First ventral about one-half as broad as the abdomen, coarsely punctured at base, and shining on apical half with a hyaline apical margin. Second shining with coarse punctures, and a red smooth apex, which is turned upward, and considerably produced over the third. The latter split in the middle, forming two round, membranous lobes. Fourth black and punctured at

base, ending in two very thin projecting membranes. Fifth flat, not membranous, incised in middle. Sixth black and shining, slightly rounded at apex, and with a median longitudinal furrow.

Described from 1 female and 4 males taken at Homestead (about 23 miles southwest of Miami) July 21, 1916. I have not come across it since.

Type: ♀, Homestead, Dade County, Fla., July 21, 1916. Allotype: ♂, Homestead, Dade County, Fla., July 21, 1916.

Its nearest relative is *S. costalis* Cresson (Texas), from which it differs in color, shape and distribution of its ornaments. Mr. J. C. Crawford, to whom I sent a ♂ specimen, compared it with specimens of ♂ *costalis* in his collection, and wrote to me, among other things, that he had never seen a *costalis* as big as the specimen (of *floridana*) sent to him, nor one with the marks red.

I take this opportuity to thank Mr. Crawford for the valuable information received from him lately, as also in previous years.

Personals.

M. P. Lesne, the well known Coleopterist, was elected an honorary member of the Entomological Society of France, December 14, 1927.

Dr. M. T. Smulyan is working on a revision of the genus *Perilampus* (Chalcidae) in No. America.

Prof. T. V. Ramakrishna Ayyar, the Indian Entomologist, has just returned from his world tour after visiting America, England, and the Continent, as announced in the NEWS for February, 1927. In America he spent about eight months at the Stanford University as a graduate research scholar. That University conferred on him the degree of Ph. D., in recognition of his past work in Zoology and Entomology in India and for a thesis on "A contribution to our knowledge of the Thysanoptera of India". Before leaving the States Dr. Ayyar visited a few Entomological Institutions including the U. S. National Museum. He then crossed over to Europe and after spending some time in the British Museum and other places of scientific interest returned to India after a short ramble on the Continent.

Dr. Ayyar with his 30 years' work at Entomology and his recent personal experiences with many eminent Entomologists

in America and Europe and with the honor of a Doctor's degree will be a valuable asset to his country. In a recent lecture he delivered on the subject of his foreign tour Dr. Ayyar expressed his great admiration for the work of American Entomologists, and his sincere gratitude for the uniform and warm hospitality he received everywhere in America.

Dr. Ramakrishna Ayyar's special groups are Indian Thysanoptera, Coccidae, and Hymenoptera, especially parasitic forms. His address is Agricultural College, Coimbatore, Lawley Road P. O., S. India.

S. MANIN, Madras Public Library, Madras, S. India.

Lepidopterorum Catalogus.

The *Lepidopterorum Catalogus* contains in Latin the names, references to the whole literature, the synonymy and the geographical distribution of all species of Lepidoptera, known today. Such a catalogue has not existed hitherto. For in the works of Staudinger-Rebel, Kirby, Cotes-Swinhoe, Dyar and others only some regions or groups are treated. It is unnecessary to dwell upon the necessity of the *Lepidopterorum Catalogus* for all students and collectors of butterflies and moths. The *Coleopterorum Catalogus* and the *Fossilium Catalogus* are issued by the same publisher.

The work is appearing in parts. Published till now: 33 parts; 3 others are in preparation. An index-volume will appear after completion of the catalogue. The literature on the biology and the development and that on the noxious species is listed with special care.

We now take the liberty to ask you to help us by treating one of the groups which are still unpublished. We address ourselves in all cases only to the first specialist. Kindly let us know your decision as soon as possible. We shall then inform you about the particulars (author's fee, free copies, etc.).

Expecting your answer we are,

Very truly yours,

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Bequest to the Entomological Society of America.

Readers of ENTOMOLOGICAL NEWS will be interested to know that the Entomological Society of America has received a bequeath of $1,000.00 left by the late Miss Mary E. Soule of Brookline, Mass. J. J. DAVIS, *Secretary-Treasurer.*

Entomological Literature

COMPILED, WITH THE ASSISTANCE OF "BIOLOGICAL ABSTRACTS," UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☞ *Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

GENERAL—Cottle, J. E.—On the wing—a retrospect. [55] 4: 187-189. **Doering, P.**—Das abbilden entomologischer objekte und präparate [14] 42: 90-92. **Dyar, H. G.**—A necessity for taxonomic workers. [10] 30: 102-103. **Hanström, B.**—Eine genetische studie über die augen und sehzentren von turbellarien, anneliden und arthropoden (Trilobiten, Xiphosuren, Eurypteriden, Arachnoiden, Myriapoden, Crustaceen und Insekten). [Kungl. Sv. Vet. Akad. Handl.] 4: 3-176, ill. **Heller, M.**—Zur kenntnis der Schutzfärbung bei insekten. [34] 78: 13-21, ill. **Horn & Schenkling.** Index litteraturae entomologicae. 1: Aalborg-Ferrière. 2: Ferril-Leconte. **Muir, F.** Some remarks on function as a base for classification and its relationship to form. [37] 7: 135-145. **Nicholson, A. J.** A new theory of mimicry in insects [The Australian Zool.] 5: 10-104, ill. **Pelseneer, P.**—La variabilité relative des sexes d'apres des variations chez Patella, Trochus et Nassa. Première partie. Variabilité relative des deux sexes dans le règne animal. [Acad. R. Belgique Cl. Sci. Mém.] 10: 3-11. ***Rüschkamp, F.**—Das älteste insekt. [Natur. und Mus.] 58: 49-51, ill. ***Strand, E.**—Miscellanea nomenclatorica zoologica et palaeontologica. [Arch. Nat.] 1926: A. 8, 30-75. [Proposes many new names on account of priority]. **Tulloch, J. B. G.**—A society for the protection of butterflies. [9] 61: 164-165. **Weiss, H. B.**—The entomology of Doctor Brickell's "Natural History of North Coralina". [6] 36: 185-188. **Weiss, H. B.**—The entomology of the Hieroglyphics of Horapolla. [6] 36: 119-122.

ANATOMY, PHYSIOLOGY, ETC.—Alpatov & Boschko-Stepanenko.—Variation and correlation in serially situated organs in insects, fishes and birds. [90] 62: 409-424, ill. **Anonymous.**—Genetics of "Bar-eye" in Drosophila. [31] 122: 422. **Brown & Heffron.**—Serum diagnosis and Rhopalocera. [6] 36: 165-168. **Crampton, G. C.**—The evolution of Insects, Chilopods, Diplopods, Crustacea and other Arthropods indicated by a study of the head capsule. [4] 60: 129-141, ill. **Dallas, E. D.**—Un coleóptero hemigimnogastra. (S). [Rev. Soc. Ent. Argentina] 1: 37-39, ill. **Daviault, L.**—Sur le développement post-embryonnaire de la Bruche du Haricot: Acanthoscelides obtectus. Suivi de considérations sur la signification phylétique de son dimorphisme larvaire. [24] 97: 105-132, ill. **Dobzhansky, T.**—The effect of temperature on the viability of superfemales in Drosophila melanogaster. [Proc. Nat. Acad. Sci. U. S. A.] 14: 671-675. **Dobzhansky & Bridges.**—The reproductive system of triploid intersexes in Drosophila melanogaster. [90] 62: 425-434, ill. **Dumont, C.**—Expériences sur la modification profonde du régime alimentaire de diverses chenilles. [24] 97: 59-104. **Glaser, R. W.**—Note on the cultivation of Metarrhizium anisopliae (Metsch.) Sorokin from the vegetative form in silkworms. [7] 21: 202. **Haskins, C. P.**—Notes on the behavior and habits of Stigmatomma pallipes. [6] 36: 179-184. **Headlee, T. J.**—Some data relative to the relationship of temperature to codling moth activity. [6] 36: 147-163, ill. **Hubault, E.**—A propos de l'action de la lumière sur la métamorphose des Trichoptères. [25] 1928: 198-199. **Jackson, D. J.**—The inheritance of long and short wings in the weevil, Sitona hispidula, with a discussion of wing reduction among bettles. [Trans. Royal Soc. Edinburgh] 55: 665-735, ill. **Mahdihassan, S.**—Symbionts specific of wax and pseudolac insects. [Archiv Protistenkunde] 63: 18-22, ill. **McMullen, D. E.**—Genetical and Cytological observations on Oryzaephilus surinamensis (The saw-toothed grain beetle). (S). [90] 62: 435-445, ill. **Melvin, R.**—Oxygen consumption of insect eggs. [Biol. Bull. Marine Biol. Lab.] 55: 135-142, ill. **Navachine, S.**—Le sexe en tant que facteur de l'évolution organique. [Scientia] 44: 99-108. **Rivnay, E.**—External morphology of the Colorado potato beetle (Leptinotarsa decemlineata). [6] 36: 125-144, ill. **Welch & Sehon.**—The periodic vibratory movements of the larva of Nymphula maculalis and their respiratory significance. [7] 21: 243-258, ill.

ARACHNIDA AND MYRIOPODA.—*Ewing, H. E.—A preliminary key to the larvae of fifteen species of the mite genus Trombicula, with descriptions of four new species. [10] 30: 77-80. ***Marshall, R.**—A new species of water mite from thermal springs. [5] 35: 92-96, ill. ***Roewer, C. F.**—Brasilianische Opilioniden, gesammelt von Bresslau im Jahre 1914. [Abhand. Her. Sencken. Naturforsch. Gesell.] 40: 333-352, ill. **Stone, M. W.**—Spiders of Rhode Island. [Park Mus. Bull.] 14: 29-32, ill. **Verhoeff, K. W.**—Myriapoda, Diplopoda. [Bronns Klass. und Ordn. des Tier-Reichs] 5: Part 2, 1073-1264, ill.

THE SMALLER ORDER OF INSECTS.—Pearman, J. V.—On sound production in the Psocoptera and on a presumed stridulatory organ. [8] 64: 179-186. **Pemberton, C. E.**—Thysanuran predatory on eggs and immature forms of termites in Borneo. [37] 7: 147. ***Priesner, H.**—Ein neuer Zeugmatothrips (Thysanoptera: Tubulifera) aus Costarica. (S). [23] 20: 189-190. ***Ris, F.**—Zwei neue Odonaten aus Chile und der Argentinischen Kordillere. (S). [49] 17: 162-174, ill. **Schmidt, E.**—Bemerkungen über Lestiden. [49] 17: 244-251, ill. ***Stewart, M. A.**—Two new Siphonaptera from Colorado. [4] 60: 148-151, ill. **Tillyard, R. J.**—Kansas permian insects. Part 10. The new order Protoperlaria: A study of the typical genus Lemmatophora. [16] 16: 185-220, ill.

ORTHOPTERA.—Caudell, A. N.—On the systematic position of the orthopterous genera Onemotettix and Phoberopus. [10] 30: 103-105, ill. **Crampton, G. C.**—Anatomical evidence that Cylindracheta is a Gryllotalpoid not an Embiid. [49] 17: 252-257, ill. **Rehn, J. A. G.**—On the relationship of certain new or previously known genera of the Acridine group Chrysochraontes (Acrididae). [Proc. Acad. Nat. Sci. Phila.] 80: 189-205, ill.

HEMIPTERA.—Barber, H. G.—Revision of the genus Ptochiomera (Lygaeidae). [6] 36: 175-177. **Borgmeier, T.**—Ein interessantes Copeognathen-Gespinst aus Brasilien. [49] 17: 155-161, ill. **Drake, C. J.**—Some Tingitidae (Heteroptera) from Honduras. [Oc. Pap. Mus. Zool. Mich. Univ.] 1928: 1-5, ill. ***Knight, H. H.**—Key to the species of Hadronema with descriptions of five new species (Miridae). [4] 60: 177-182. ***Knight, H. H.**—Key to the species of Oncerometopus with descriptions of five new species (Miridae). [6] 36: 189-194. ***Knowlton, G. F.**—A few western aphids with descriptions of three new species. [7] 21: 259-

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SPECIAL NOTICES.—Catalogue of Indian Insects.—[Of this work parts 14—Palpicornia by d'Orchymont, 15—Cecidomyidae by Senior-White, 16—Cosmopterygidae and 17—Yponomeutidae by Bainbrigge Fletcher have just appeared].

ON THE MALE OF DIXIPPUS MOROSUS, and some observations and experiments carried on with this species by Dr. VIKTOR JANDA. Translated from the author's German resumé, published in Casopis, Vol. XXIII, pp. 27-42, 1926, with plates.

Casopis is a Czecho-Slovakian Journal, available to but few English-speaking people, and while the studies of the author have also been carried on by other investigators, yet, the literature on this subject is very meagre, and it appears to the translator that the article is of sufficient importance to interest the general English reader of biological literature.

"Among the parthenogenetic and bisexual reproduction of the Phasmids there are many transitional stages. There are species where males are great rarities, as *Bacillus algericus, B. gallicus, B. atticus, Dixippus morosus* and others, and some unknown, but also such in which the males predominate, as *Leptynia attenuata.* Among 1000 *D. morosus* specimens, there is but one male, while among 100 *L. attenuata* there are but 35 females. Gynandromorphs in all possible combinations of male and female characters have been observed. The *Dixippus* males and females are diploid; two polar bodies are formed in the eggs of *D. morosus;* they retain however their full chromosome number. According to Sinety the spermatozoe determine the male sex in some of the Phasmids, the males of *D. morosus,* however, can generate from unfertilized eggs.

In the following lines I will give my conclusions, based upon observations and experiments which I have carried on.

In the beginning of May, 1925, I found among my parthenogenetic rearing of *D. morosus* a male (imago), which lived until the end of June (same year). It was 6 cm. long, nearly flat, olive color. The form of the abdominal segment and copulatory apparatus of this male is figured on plate II, ff. 1, 2, 3 (l.c.), I did not observe a copula.

From a female isolated in the larval stage, I received eight parthenogenetic generations; the vitality of the last generation was not in the least impaired.

The length of the life of the parthenogenetic females was 9½ to 10 months.

One isolated female laid 264 eggs during its whole life, among them 4 a trifle smaller than normal, and 8 dwarfed; from another isolated female I received 322 normal eggs, of medium size and two dwarfed; the egg-laying process required about six months; among 2220 eggs from different females were 11 medium-sized, 17 dwarfed, and one with two micro-

pyles, and without opercule. The dwarfed eggs as well as the egg with the two micropyles, were sterile; average length of my females was 7.4 cm., two were but 6.1 and 6.2 cm., respectively.

The eggs of the dwarfed females were of quite normal dimensions.

On March 19th, 1919, I placed freshly laid *Dixippus* eggs in the following temperatures, one directly after the other: 44°C (20 minutes), 42°C (20 minutes) and 35°C (15 minutes). On August 5th, 1919, the first larvae appeared.

Long exposure to ether-fumes produced the falling off of the elliptical shields and micropyles.

When the temperature falls to 0°C (zero) or below, one can often observe the larvae in the cage falling to the floor, and lie there with outstretched legs in a stupified condition. At 36°C there is a noticeable activity in the movement of the larvae; at 39°-40°C, after a half hour's exposure, a stifling takes place, which however after 2-10 minutes in normal temperature, fully restores the larvae; after 15 minutes exposure to a temperature of 45°C, all the larvae of *Dixippus* died.

In warm water 40°-45°C, laming of the legs took place, but when brought to normal requirements, they recovered in about two hours and became lively.

If ether-fumes are injected into the cage, there is no noticeable change in the behavior of the larvae for about five minutes, when they begin to move their front legs; these movements last about five minutes, and then one after another they fall to the floor with outstretched legs. The larvae and imagos can endure ether fumes fairly well. Specimens of *Dixippus* from which the brain ganglia had been entirely removed, did not change in color, nor did they exhibit any disturbance in their movements, save that they moved faster; only after the destruction of the oesophagus with a needle or after decapitation, do they first show signs of the loss of coordinate walking power, and the decapitated specimens lie without moving, even if attempt is made to force them to move (compare Schleip and Buddenbrock); contrary to this I have found with *Nepa cinerea* and some other Rhynchota, that beheaded specimens retained to the last degree the complicated coordinate walking, grasping, and swimming movements.

If the head of a decapitated *Dixippus* is tied on with a fine thread, so that not much loss of blood takes place, the specimens can live 12 to 15 days, and lay a number of eggs.

The autotomy, especially of the hind legs, followed from a preformed fracture, when the leg in the proximal quarter of

the femur was cut or injured, and the leg rested in a splint. At times the throwing off of the remainder of the leg took place only after moulting. The autotomy occurs but seldom after an injury of the leg, and the remainder of the tibiae often remains connected at the fracture, if the stumps of the feet assist in moving, thereby producing pressure against the splint. Cast off legs were again regenerated; the development of regenerated legs is the more complete the younger the individual is.

Also the eyes of *D. morsus* may, after entire extirpation, become regenerated. The regenerated eyes are much smaller than the normal. The regeneration is the more complete, the more moultings the operated individual undergoes. In cases where the regeneration of the totally removed eyes does not take place, the wound heals completely. The regeneration of operated eyes in *Tenebrio molitor, Periplaneta orientalis,* and *Nepa cinerea* proved successful experimentally. The inheritance of the dark and green colors of parthenogenetic females of *Dixippus* did not take place under ordinary experimental conditions. A change of color from the touch before and after the ether narcotization as also by the dipping of the larvae and imagos of *Dixippus* in warm water (44°), I have not observed." FRANK HAIMBACH.

OBITUARY.

Deaths of the following well-known entomologists have been reported in recent numbers of various journals, but have not been noticed in the NEWS hitherto.

ENRICO BRUNETTI died in London, January 21, 1927, at the age of 63 years. Of Italian ancestry, a Londoner by birth, a musician by occupation, he devoted many years to the study of the Diptera, fifteen of which he spent in India. (*Ent. Mo. Mag.,* Oct., 1927.)

JOHN HARTLEY DURRANT, born at Hitchin, Herts, England, Jan. 10, 1863, died at Putney, Jan. 18, 1928. Interested in the Microlepidoptera from an early age, he became curator for Lord Walsingham in 1886. The Walsingham collection was transferred to the Natural History Museum at South Kensington in 1910 and Durrant accompanied it there, becoming a member of the scientific staff. He was associated with Lord Walsingham in the preparation of the volumes on Microlepi-

doptera of the *Biologia Centrali-Americana* and the *Fauna Hawaiiensis*, as well as of articles on these moths in various journals, and of the Merton Rules of entomological nomenclature. (*Ent. Mo. Mag.*, March, 1928.)

Lt.-Col. J. W. YERBURY died Nov. 10, 1927, in Charing Cross Hospital, London, as the result of being knocked down by a motor car. He was born March 30, 1847, at Cerampore, Bengal, and served in the Royal Artillery from 1868 to 1892 in various parts of the world. He made extensive collections of insects of all orders which he distributed to friends and museums. From 1895 onward he was especially interested in Diptera. (*Ent. Mo. Mag.*, April, 1928.)

GERVASE F. MATTHEW died on Feb. 10 at Dovercourt, Essex, England, on the eve of his 86th birthday. In 1861 he entered the Royal Navy as a clerk and retired in 1902 as Paymaster-in-Chief. "Throughout his long period of active employment, which included prolonged commissions on the Pacific, Australian and Mediterranean stations, he availed himself to the full of such opportunities for the study of Natural History as came in his way, though he concentrated mainly on the Lepidoptera of which he made large collections on every voyage. . . . On his retirement he settled at Dovercourt. . . . and continued to work this highly productive district until well past his eightieth year, as well as devoting much time and skill to the rearing of Lepidoptera. . . . At the time of his death [he] was one of the two Senior Fellows [of the Entomological Society of London], the Rev. A. E. Eaton, happily still with us, having been elected on the same day" [in July, 1865]. (J. J. W. in *Ent. Mo. Mag.*, April, 1928.)

The death of Marquis HENRI DU BUYSSON, known for his work on Elateridae, was announced at the meeting of the Entomological Society of France held on Oct. 12, 1927, but without further particulars.

As we go to press we regret to read in *Science* for Oct. 26, the announcement of the deaths of Dr. EUGENE AMANDUS SCHWARZ, of Washington, on Oct. 15, 1928, and of Dr. JEAN BRETHES, of Buenos Aires, on July 2, 1928.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

For Exchange—South American and Celebes butterflies by 100 monthly arrivals, also South and North American pupae and cocoons. Mrs. Emma Kessler, 499 Manhattan Ave., New York.

Exchange—Northern Idaho Lepidoptera to exchange for exotics or other showy specimens. C. W. Herr, Priest River, Idaho.

Canarian Fauna—For all particulars apply to H. E. Appenhagen, Sta Cruz, Teneriffe, Apartado No. 202.

I am revising the genus *Ceuthophilus* (Orthoptera, Tettigoniidae, Rhaphidophorinae), and will be glad to have material from any part of the country for study and determination. Specimens will be promptly returned.—Theodore H. Hubbell, Museum of Zoology, University of Michigan, Ann Arbor, Michigan.

Lepidoptera from all parts of the world in exchange for rarer Sphingidae, Saturnidae and Bombycidae from the Southern States and Mexico. Send lists of desiderata to Henry Wormsbacher, 1357 St. Charles Ave., Lakewood, Ohio.

Wanted: live pupae of large moths, especially Actias luna, by purchase or in exchange for silkworm eggs.—John H. Gerould, 36 Occom Ridge, Hanover, N. H.

Western Lepidoptera: Sphingidae, Aegeriidae, Cossidae, Catocala and the major Bombycidae in exchange for equally rare species of the same families. Short lists of the *very rare species* only, desired. O. C. Poling, Box 82, Fort Davis, Texas, U. S. A.

Mycetophilidae—Will exchange or identify material in this family. C. F. Adams, Indiana State Board of Health, Indianapolis, U. S. A.

Wanted—"Check List of the Lepidoptera of Boreal America" by Wm. Barnes and J. McDunnough. Kindly quote price. E. J. Dornfeld, 144 North Ave., Milwaukee, Wis.

Wanted—Moths of any species of the genus **Apantesis:** also eggs or larvae. Will determine specimens. Want to hear from anyone who will collect in this genus. Dr. E. T. Learned, Fall River, Mass.

Wanted—Names and addresses of collectors in foreign countries, also some second-hand insect cases. Write Mrs. Robert Milde, Lewiston, Minn.

Catopini—Catops (Choleva), Prionochaeta, Ptomaphagus. Wanted to borrow all possible specimens of these genera from North America for a revisional study. Correspondence solicited. Melville H. Hatch, Dept. of Zoology, Univ. of Wash., Seattle, Wash.

Chrysomelidae—Cryptocephalinae and Halticinae—will exchange insects of other orders for above named leaf-bettles. Also many duplicates in other groups of coleoptera.—Paul N. Musgrave, 514 Mt. Vernon Ave., Fairmont, W. Va.

Argynnis of the world wanted by exchange for local Lepidoptera, or by purchase. S. P. Hayes, Jr., Amherst College, Amherst, Mass.

Wanted for cash, Catocala eggs: cara, vidua, obscura, residua, ultronia, retecta, praeclara, amatrix, uniiuga, pura, insolabilis, lacrymosa, judith.—E. W. K. Schwarz, 40 W. 84th St., New York City.

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